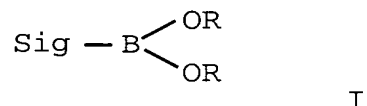


This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

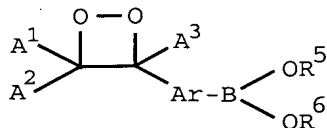
Claim 1 (Currently Amended): A compound I having the formula:



- 5 wherein Sig ~~comprises~~ is an aromatic or heteroaromatic ring group substituted with a dioxetane ring and is capable of being detected by ~~a detectable property~~ chemiluminescence or bioluminescence when the group B(OR)<sub>2</sub> is replaced by a hydroxyl group (-OH) or its anion (-O<sup>-</sup>), B is a boron atom,
- 10 each R is independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring, ~~wherein the compound of formula I itself does not possess the detectable property or does so~~
- 15 ~~only to a very weak degree and the detectable property is selected from chemiluminescence or bioluminescence.~~

Claims 2-4 (Canceled)

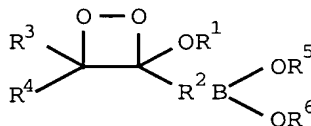
Claim 5 (Currently Amended): The compound of claim 4 1  
 having the formula:



- 5 wherein A<sup>1</sup> - A<sup>3</sup> represent organic groups having from 1-20  
 carbon atoms and can optionally contain heteroatoms  
 selected from N, O and S atoms, and Ar is an aromatic or  
 heteroaromatic ring group, and wherein A<sup>1</sup>-A<sup>3</sup>, and Ar can be  
 substituted with non-hydrogen atoms, and R<sup>3</sup> and R<sup>4</sup> are  
 10 independently selected from acyclic and cyclic organic  
 groups containing from 3-20 carbon atoms and which can be  
 substituted with heteroatoms, and R<sup>5</sup> and R<sup>6</sup> are  
 independently selected from hydrogen and lower alkyl groups  
 and can be joined together as a straight or branched  
 15 alkylene chain forming a five or six-membered ring or an  
 arylene ring.

Claim 6 (Original): The compound of claim 4 wherein A<sup>1</sup> and  
 A<sup>2</sup> or A<sup>1</sup> and A<sup>3</sup> or A<sup>2</sup> and A<sup>3</sup> and Ar are combined to form a ring.

Claim 7 (Original): The compound of claim 4 wherein the dioxetane has the formula:



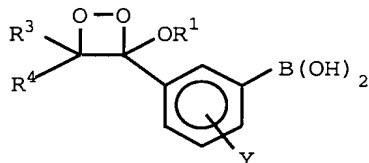
5 wherein R<sup>1</sup> is is an organic group having from 1-20 carbon atoms which can be combined with R<sup>2</sup> or R<sup>3</sup>, R<sup>2</sup> is an aromatic or heteroaromatic ring group which can include additional substituents selected from halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl,  
 10 amino and alkylamino groups, and R<sup>3</sup> and R<sup>4</sup> are independently selected from acyclic and cyclic organic groups containing from 3-20 carbon atoms and which can be substituted with heteroatoms.

Claim 8 (Original): The compound of claim 7 wherein R<sup>3</sup> and R<sup>4</sup> are combined together in a cyclic or polycyclic alkyl or a cyclic or polycyclic alkenyl group which is spiro-fused to the dioxetane ring and contains 6 to 20 carbon atoms and  
 5 which can include additional non-hydrogen substituents.

Claim 9 (Original): The compound of claim 7 wherein R<sup>3</sup> and R<sup>4</sup> are combined together to form an adamantyl group which can be substituted with one or more substituent groups selected from halogens, alkyl, substituted alkyl, alkoxy,  
 5 substituted alkoxy, carbonyl, carboxyl, phenyl, substituted phenyl, amino and alkylamino groups.

Claim 10 (Original): The compound of claim 7 wherein R<sup>3</sup> and R<sup>4</sup> are each branched alkyl or cycloalkyl groups having from 3-20 carbon atoms.

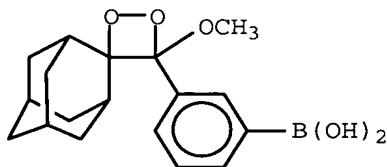
Claim 11 (Original): The compound of claim 7 wherein the signalling compound has the formula:



5

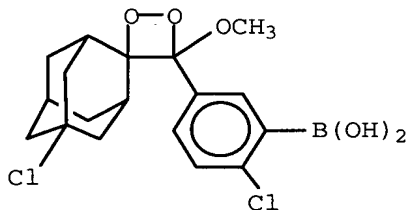
wherein Y is a substituent group selected from hydrogen, halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl, phenyl, substituted phenyl, amino and alkylamino groups.

Claim 12 (Original): The compound of claim 9 having the formula:



5

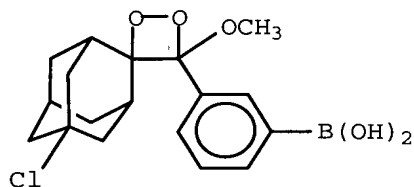
Claim 13 (Original): The compound of claim 11 having the formula:



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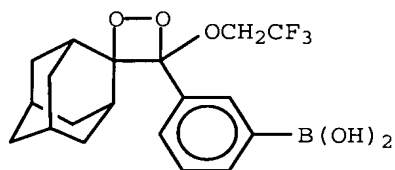
Claim 14 (Original): The compound of claim 9 having the formula:

5



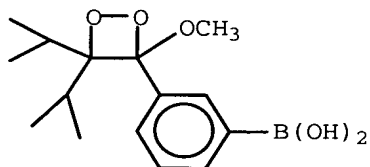
Claim 15 (Original): The compound of claim 9 having the formula:

5



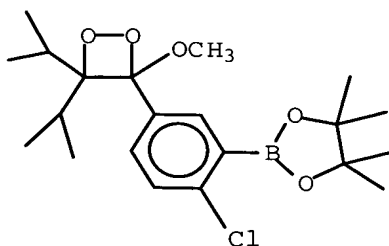
Claim 16 (Original): The compound of claim 9 having the formula:

5

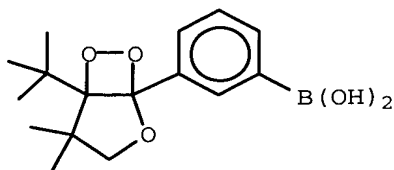


Claim 17 (Original): The compound of claim 9 having the formula:

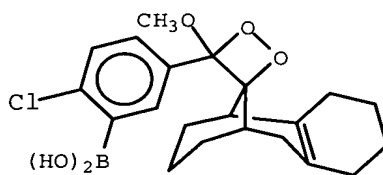
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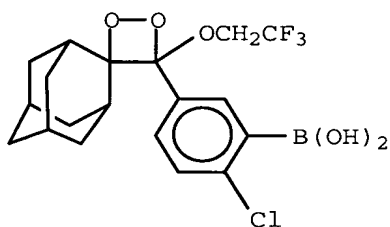
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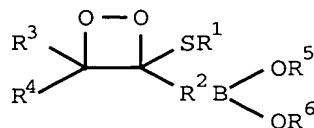
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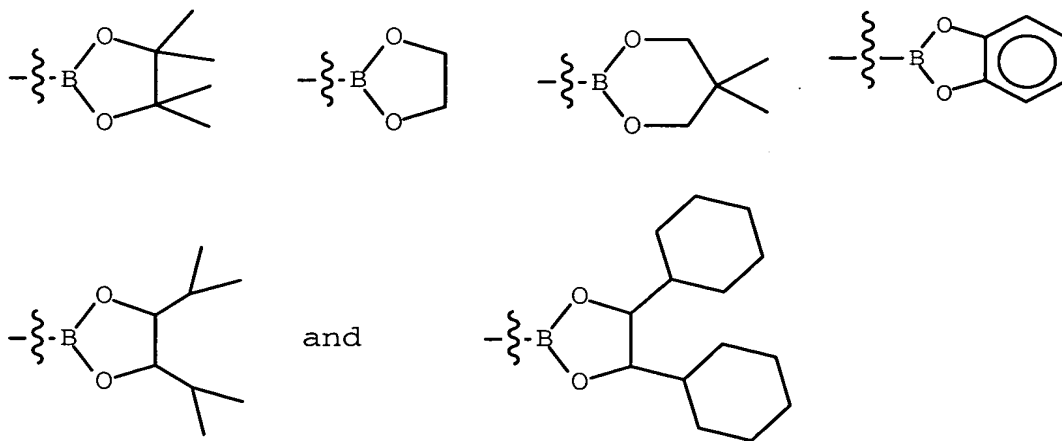
Claim 21 (Original): The compound of claim 5 wherein the dioxetane has the formula:



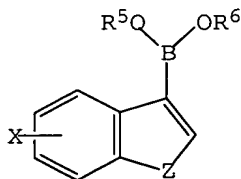
5 wherein R<sup>1</sup> is an organic group having from 1-20 carbon atoms which can be combined with R<sup>2</sup> or R<sup>3</sup>, R<sup>2</sup> is an aromatic or heteroaromatic ring group which can include additional substituents selected from halogens, alkyl, substituted alkyl, alkoxy, substituted alkoxy, carbonyl, carboxyl,  
 10 amino and alkylamino groups, and R<sup>3</sup> and R<sup>4</sup> are independently selected from acyclic and cyclic organic groups containing from 3-20 carbon atoms and which can be substituted with heteroatoms.

Claim 22 (Original): The compound of claim 5 wherein R<sup>5</sup> and R<sup>6</sup> are each hydrogen atoms.

Claim 23 (Original): The compound of claim 5 wherein R<sup>5</sup> and R<sup>6</sup> are combined to form a ring selected from:

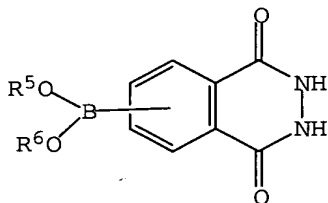


Claim 24 (Currently Amended): ~~The compound of claim 1 A~~  
compound having the formula:



5  
wherein Z is selected from O, S and NR<sup>8</sup>, wherein R<sup>8</sup> is H or  
Si(R<sup>9</sup>)<sub>3</sub>, R<sup>9</sup> is C<sub>1</sub>-C<sub>6</sub> alkyl or phenyl, and X represents one  
or two iodine, bromine or chlorine atoms, and R<sup>5</sup> and R<sup>6</sup> are  
independently selected from hydrogen and lower alkyl groups  
10 and can be joined together as a straight or branched  
alkylene chain forming a five or six-membered ring or an  
arylene ring.

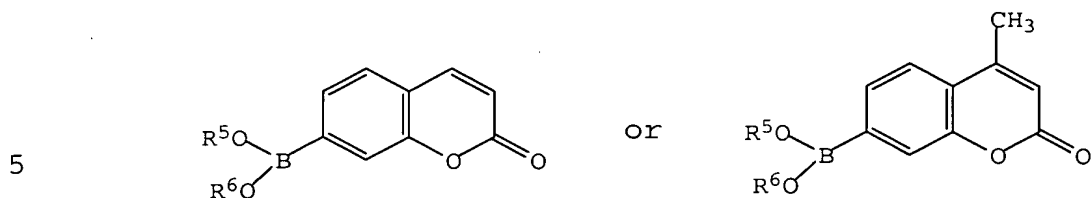
Claim 25 (Currently Amended): ~~The compound of claim 1 A~~  
compound having the formula:



5  
wherein R<sup>5</sup> and R<sup>6</sup> are independently selected from hydrogen  
and lower alkyl groups and can be joined together as a  
straight or branched alkylene chain forming a five or six-  
10 membered ring or an arylene ring.

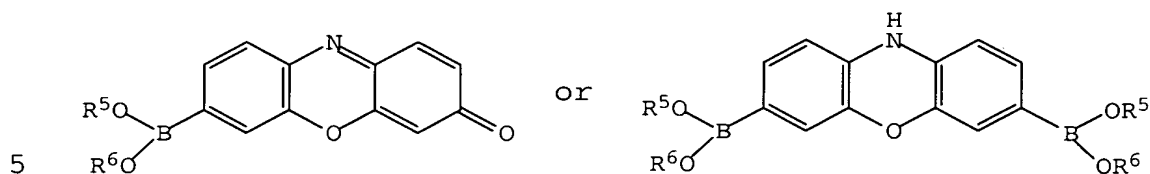


Claim 26 (Currently Amended): ~~The compound of claim 1~~ A compound having the formula:



wherein R<sup>5</sup> and R<sup>6</sup> are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-  
10 membered ring or an arylene ring.

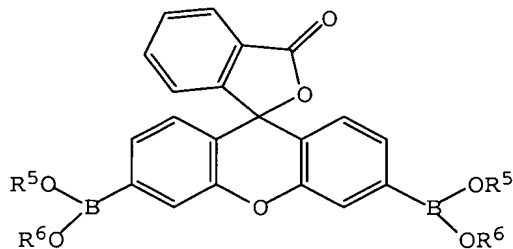
Claim 27 (Currently Amended): ~~The compound of claim 1~~ A compound having the formula:



wherein R<sup>5</sup> and R<sup>6</sup> are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a five or six-membered ring or an arylene ring.

Claim 28 (Currently Amended): ~~The compound of claim 1 A~~  
compound having the formula:

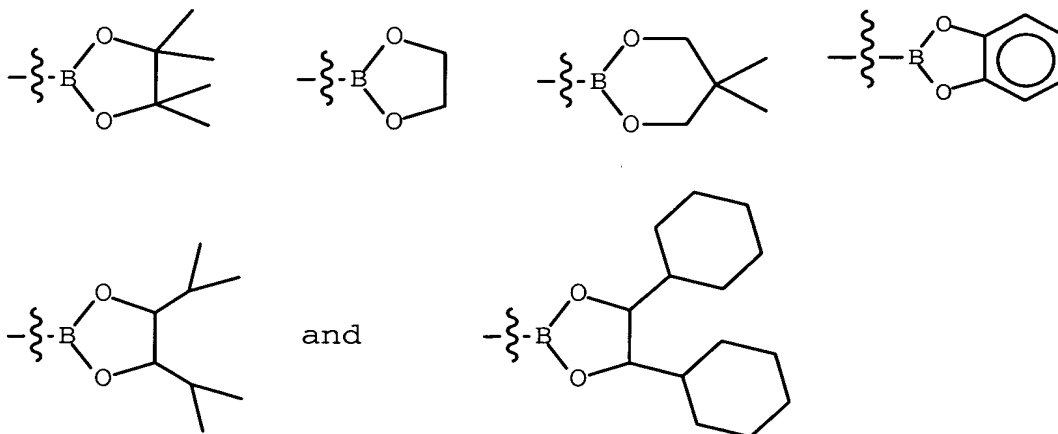
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wherein  $R^5$  and  $R^6$  are independently selected from hydrogen  
 and lower alkyl groups and can be joined together as a  
 straight or branched alkylene chain forming a five or six-  
 10 membered ring or an arylene ring.

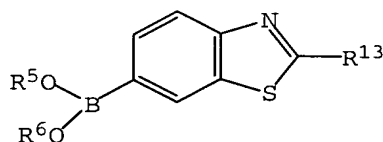
Claim 29 (Original): The compound of claim 1 wherein the R  
 groups are combined to form a ring selected from:

5

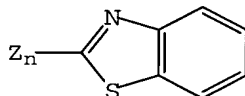


Claim 30 (Original): The compound of claim 1 wherein the R  
 groups are both hydrogen atoms.

Claim 31 (Original): A compound having the formula:

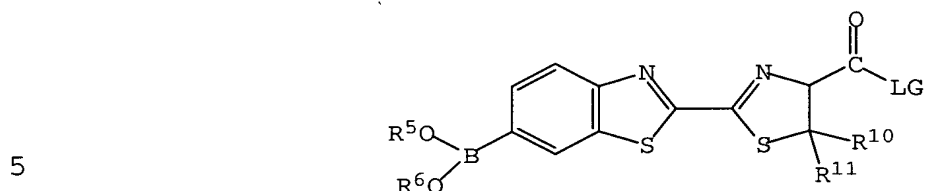


5 which is capable of being detected by a detectable property  
selected from fluorescence, chemiluminescence or  
bioluminescence when the group B(OR<sup>5</sup>)(OR<sup>6</sup>) is replaced by a  
hydroxyl group (-OH) or its anion (-O<sup>-</sup>), wherein B is a  
boron atom, R<sup>5</sup> and R<sup>6</sup> are independently selected from  
10 hydrogen and lower alkyl groups and can be joined together  
as a straight or branched alkylene chain forming a five or  
six-membered ring or an arylene ring, and R<sup>13</sup> is  
independently selected from cyano, imine, carbonyl,  
thiazole, carbonyl-substituted thiazole and benzothiazole  
15 groups or a group



wherein Z is C-C double or triple bond or aromatic ring and  
n is 1 or 2, wherein the compound itself does not possess  
20 the detectable property or does so only to a very weak  
degree.

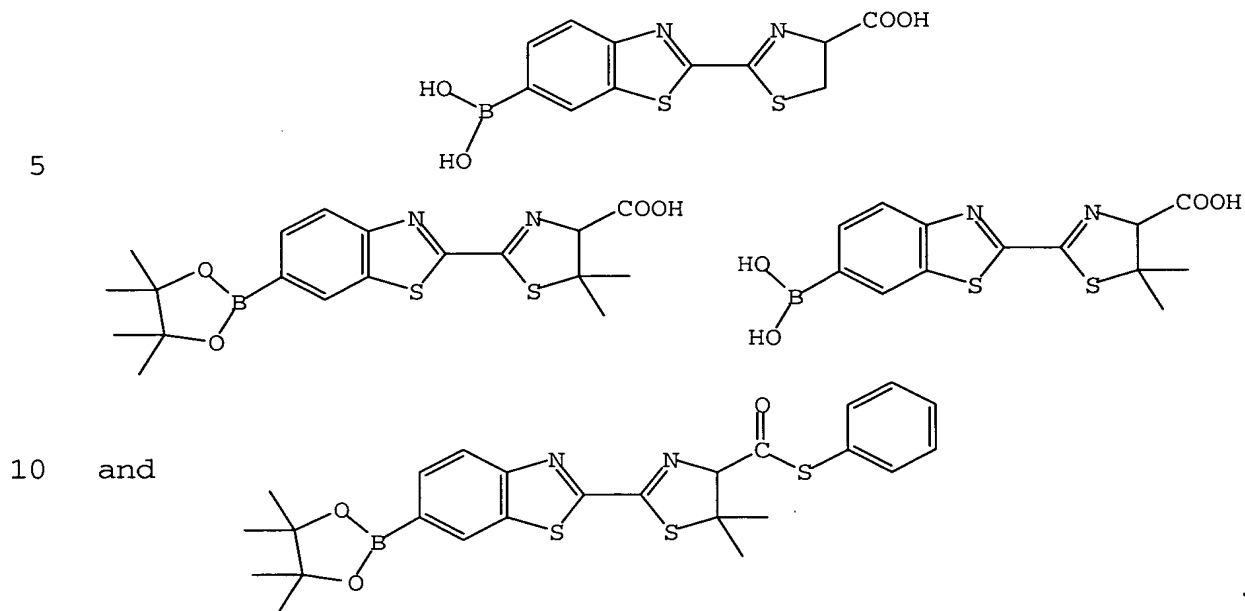
Claim 32 (Original): The compound of claim 30 having the formula:



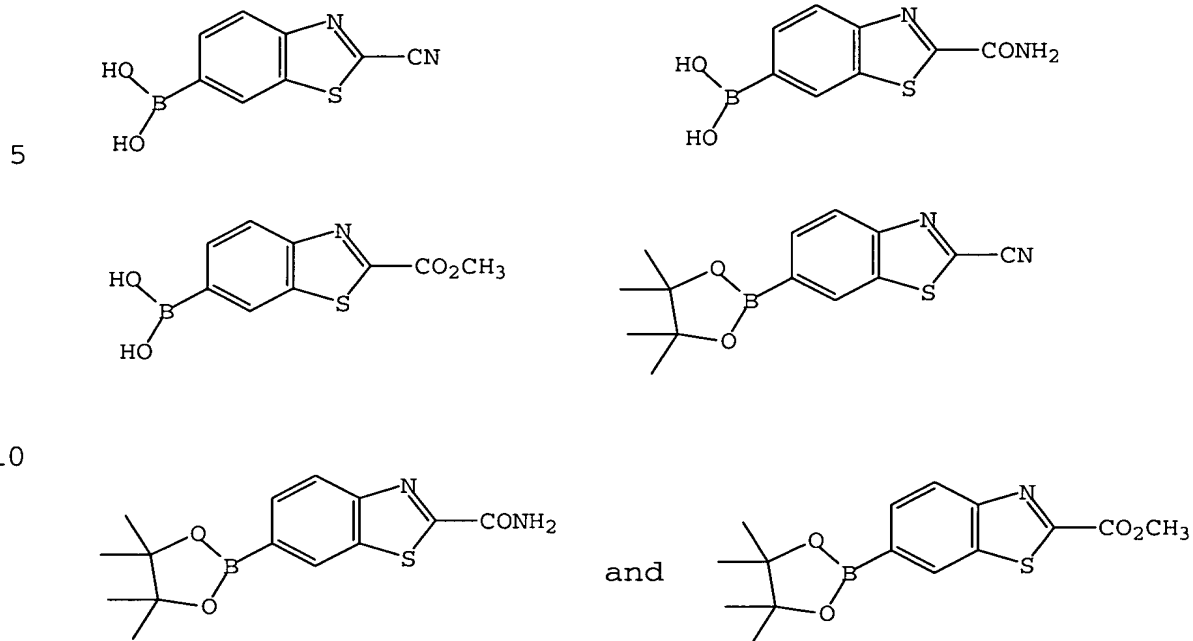
wherein LG is a leaving group and R<sup>10</sup> and R<sup>11</sup> are hydrogen or C<sub>1</sub>-C<sub>4</sub> alkyl, and R<sup>5</sup> and R<sup>6</sup> are independently selected from hydrogen and lower alkyl groups and can be joined together as a straight or branched alkylene chain forming a  
10 five or six-membered ring or an arylene ring.

Claim 33 (Original): The compound of claim 31 wherein the leaving group is selected from OH, OR<sup>12</sup>, SR<sup>12</sup> and O-AMP groups, R<sup>12</sup> is a substituted or unsubstituted alkyl or aryl group, and AMP is adenosine monophosphate.

Claim 34 (Original): The compound of claim 31 selected from the group:



Claim 35 (Original): The compound of claim 30 selected from the group:



Claim 36 (Original): The compound of claim 30 selected from the group:

